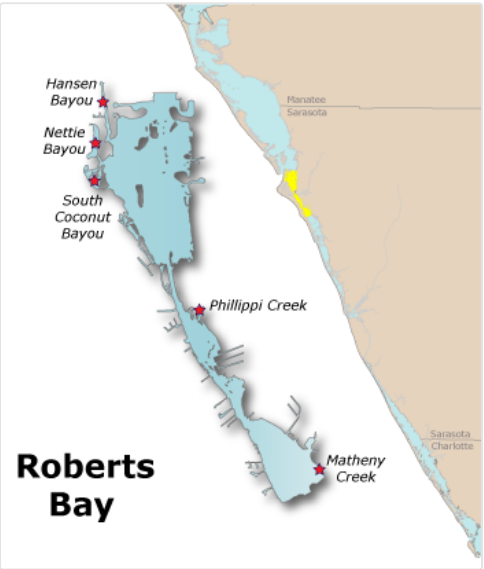
Roberts Bay Condition Report for 2013

PASS

Chl-a N P

3 out of 3 indicators were rated as **PASS**.

All three indicators must pass for the bay to be rated as **PASS**.



Bays included in this report:
Grand Canal, **Hansen Bayou**, **Nettie Bayou**, **Roberts Bay Sarasota**, **South Coconut Bayou**

Summary:

After improving in 2012, the overall health of Roberts Bay shows a downward trend in 2013, with a noticeable increase in the metrics for nutrient pollution during the latter half of the year. Heavy rainfall during the late summer/early fall may have been a contributing factor. Phosphorus levels remain well below the target value, but nitrogen and chlorophyll show an upward trend and were above target levels, though below thresholds.

Water Quality: All three water quality indicators (chlorophyll *a*, nitrogen, and phosphorus) were rated as pass (below the threshold). However the mean values for all three water quality metrics were higher than the previous year. The mean for chlorophyll *a* was calculated as an arithmetic mean and the means for nitrogen and phosphorus were calculated as geometric means (per the Numeric Nutrient Criteria outlined in the Florida Administrative Code, section 62-302.532). The score for both chlorophyll *a* and nitrogen declined from “Excellent” to “Good”, as their mean values in 2013 were not below targets. Mean Chlorophyll *a* concentration (0.0101 mg/l) was above its target

value of 0.0082 mg/l, but below the threshold level of 0.011 mg/l. Similarly, mean nitrogen concentration was 0.5142 mg/l, between its target and threshold values of 0.450 mg/l and 0.5406 mg/l, respectively. Although the mean value for phosphorus increased somewhat (to 0.0989 mg/l), it is still well below its target value of 0.190 mg/l, so it retains its score of “Excellent” from the previous year.

Biotic Indicator: Measurement of the biotic indicator, seagrass, is performed at two-year intervals and is due for monitoring again in 2014. While total seagrass acreage in Roberts Bay shows an increasing trend, the 2012 acreage of 300 acres is still slightly below the target value of 348 acres.

Water Chemistry Ratings

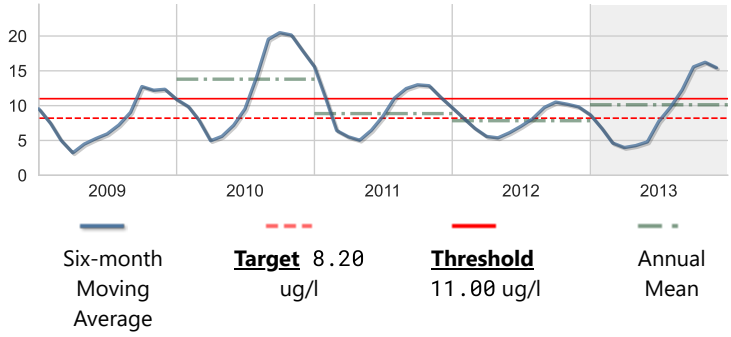
Total nitrogen, total phosphorus, and chlorophyll *a* levels are monitored carefully by water resource managers and used by regulatory authorities to determine whether a bay meets the water quality standards mandated by the Clean Water Act. The trend graphs for these indicators are shown below, along with their target and threshold values. A target value is a desirable goal to be attained, while a threshold is an undesirable level which is to be avoided. An individual indicator receives an "Excellent" rating if its mean value is below the target, a "Good" rating if its mean value is above the target but does not exceed the threshold, and a "Caution" rating if the mean value exceeds the threshold.

The charts below illustrate the general trend of water quality parameters. They show a six-month running average, which moderates high and low values in the data.

Chl-a Chlorophyll a

Score: Good

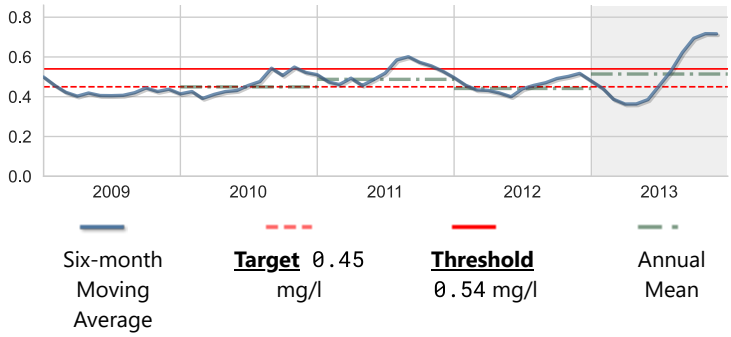
Units: ug/l	Year 2013	Historical period of record
High	34.53	48.42
Mean	10.13	7.90
Low	1.90	0.33
No. of Samples	60	1007



N Nitrogen, Total

Score: Good

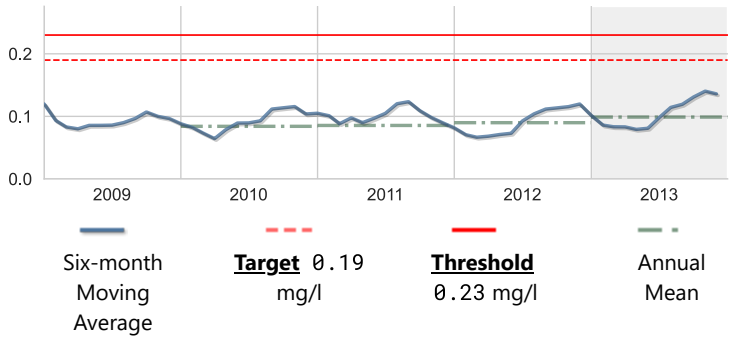
Units: mg/l	Year 2013	Historical period of record
High	1.046	1.376
Mean	0.514	
Low	0.255	0.065
No. of Samples	60	998



P Phosphorus, Total

Score: Excellent

Units: mg/l	Year 2013	Historical period of record
High	0.240	0.480
Mean	0.099	0.140
Low	0.050	0.050
No. of Samples	60	1028

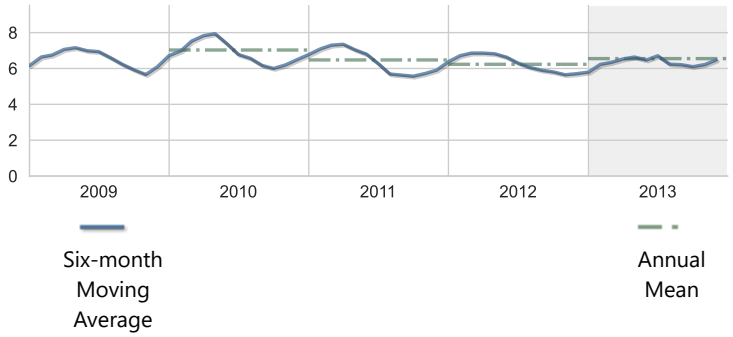


Other Measures of Bay Health

In addition to nutrient levels and chlorophyll concentration, dissolved oxygen levels, and water clarity are also objective indicators of bay health. These have complex interactive cycles which are affected by rainfall, temperature, and tidal action, as well as other factors. High nutrient levels (nitrogen and phosphorus) can stimulate excessive growth of marine algae (indicated by chlorophyll *a* level), resulting in reduced water clarity (and increased light attenuation) and depleted oxygen levels. Both plants and animals in a bay need oxygen to survive, and the seagrasses which provide food and cover for bay creatures need light for photosynthesis.

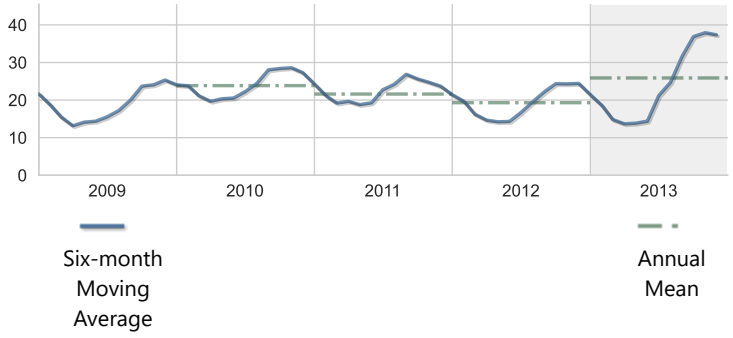
Dissolved Oxygen

Units: mg/l	Year 2013	Historical period of record
High	8.70	11.40
Mean	6.55	6.46
Low	4.50	3.60
No. of Samples	60	1141



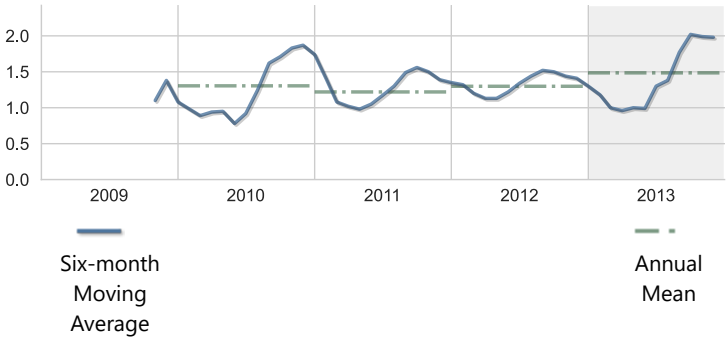
Apparent Color

Units: PCU	Year 2013	Historical period of record
High	70.00	150.00
Mean	25.88	23.26
Low	9.00	2.00
No. of Samples	60	1028



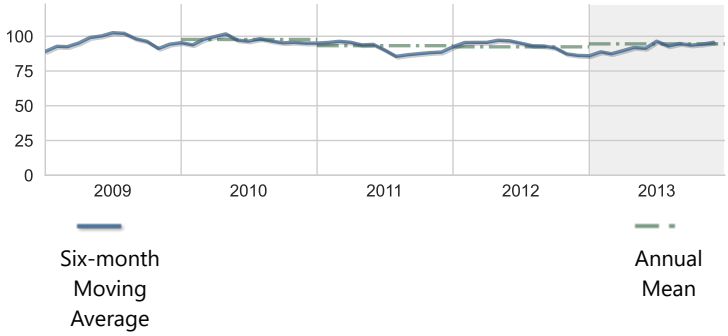
BOD, Biochemical oxygen demand

Units: mg/l	Year 2013	Historical period of record
High	3.50	5.90
Mean	1.49	1.42
Low	0.60	0.50
No. of Samples	60	892



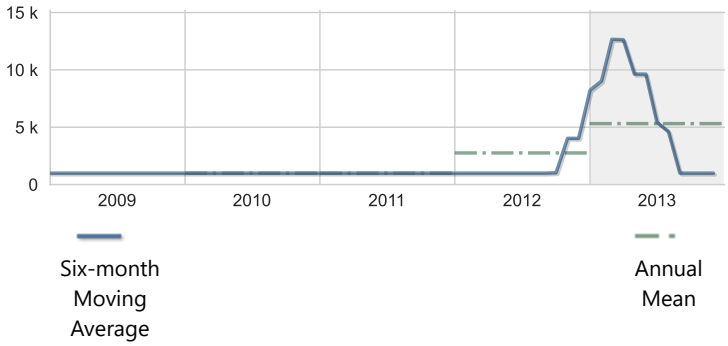
Dissolved oxygen saturation

Units: percent (%)	Year 2013	Historical period of record
High	136.00	173.00
Mean	94.53	93.89
Low	68.00	50.00
No. of Samples	60	1166



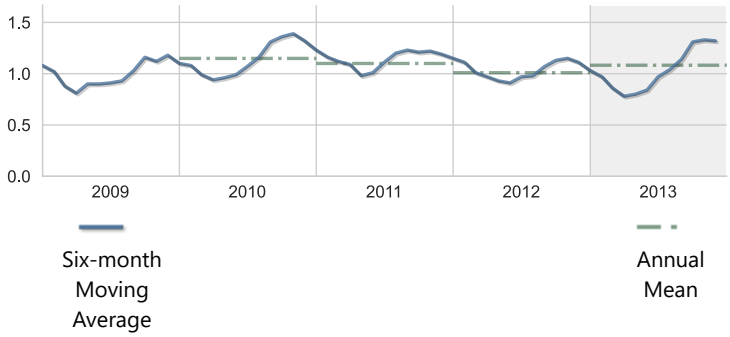
Karenia brevis ("red tide")

Units: #/l	Year 2013	Historical period of record
High	83000.00	912000.00
Mean	5316.67	8388.89
Low	1000.00	1000.00
No. of Samples	60	522



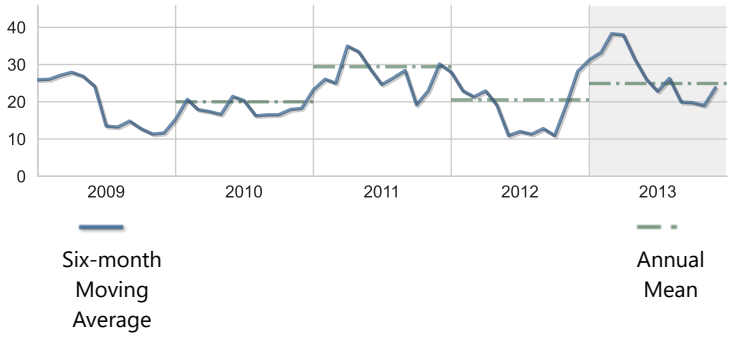
Light Attenuation

Units: K(1/m)	Year 2013	Historical period of record
High	2.19	3.56
Mean	1.08	1.02
Low	0.45	0.19
No. of Samples	60	947



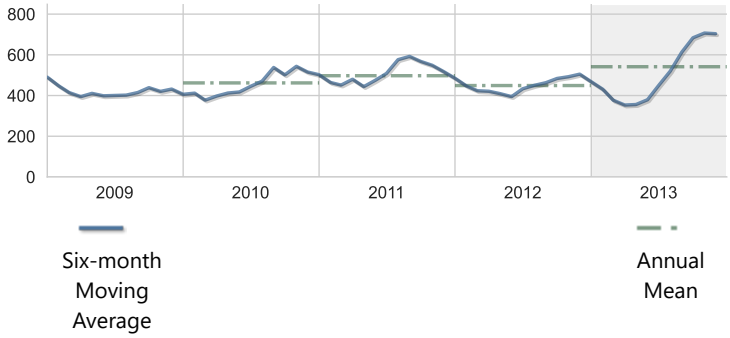
Nitrogen, Ammonia + Ammonium as N

Units: ug/l	Year 2013	Historical period of record
High	92.00	243.00
Mean	24.92	24.63
Low	5.00	5.00
No. of Samples	60	1028



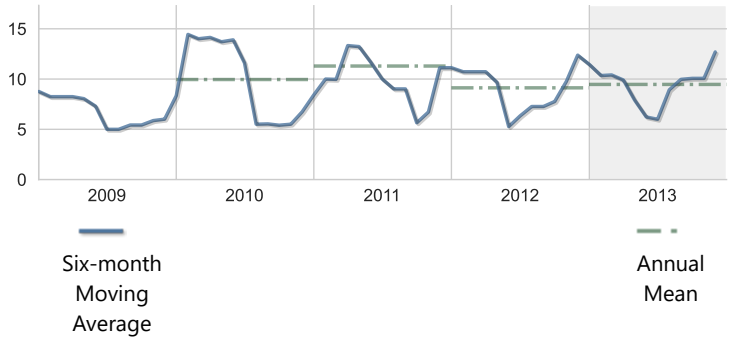
Nitrogen, Kjeldahl

Units: ug/l	Year 2013	Historical period of record
High	970.00	1320.00
Mean	541.50	438.41
Low	250.00	60.00
No. of Samples	60	1028



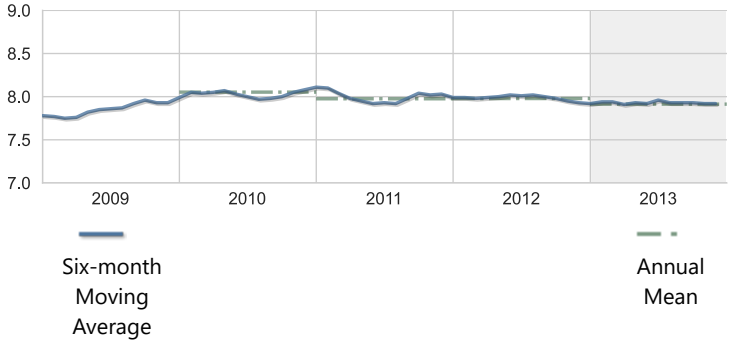
Nitrogen, Nitrite + Nitrate as N

Units: ug/l	Year 2013	Historical period of record
High	76.00	339.00
Mean	9.47	11.87
Low	5.00	5.00
No. of Samples	60	1460



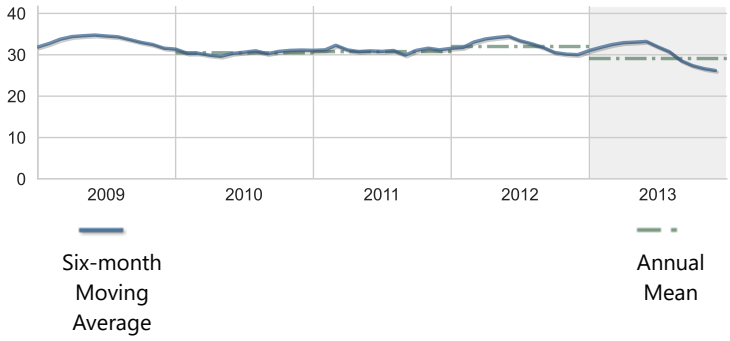
pH

Units: None	Year 2013	Historical period of record
High	8.20	8.40
Mean	7.91	7.88
Low	7.70	7.10
No. of Samples	60	1166



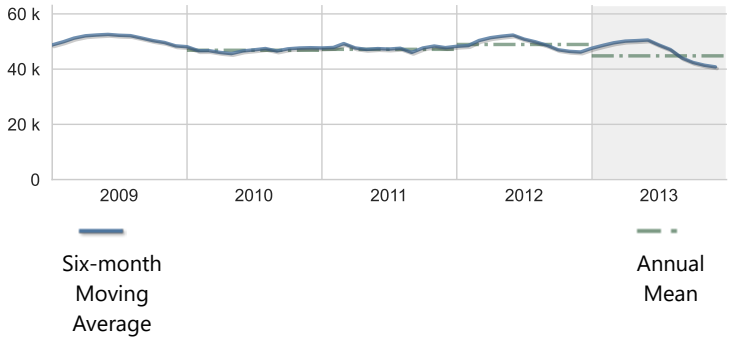
Salinity

Units: PSS	Year 2013	Historical period of record
High	35.00	38.80
Mean	29.10	30.66
Low	12.70	1.80
No. of Samples	60	1143



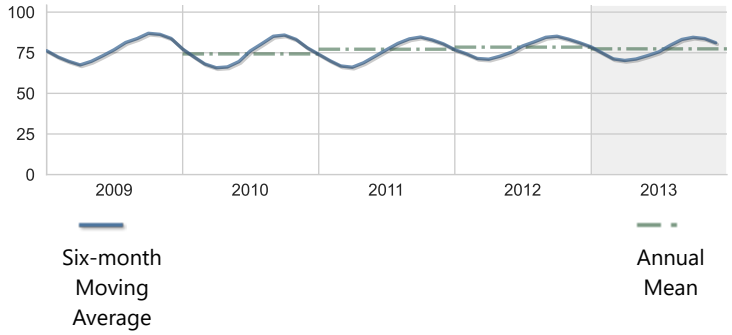
Specific conductance

Units: umho	Year 2013	Historical period of record
High	52960.00	58320.00
Mean	44803.50	46926.43
Low	21190.00	3370.00
No. of Samples	60	1166



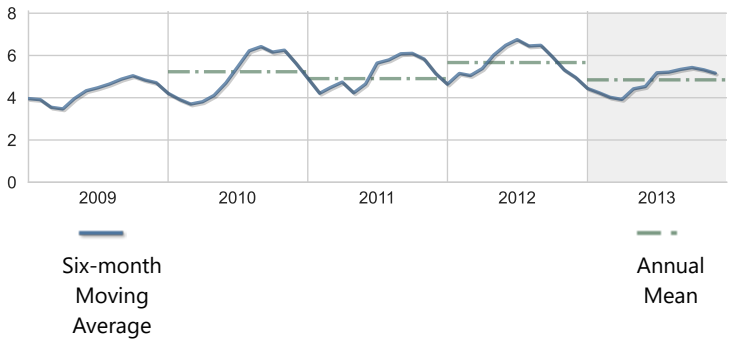
Temperature, water

Units: deg F	Year 2013	Historical period of record
High	88.88	92.48
Mean	77.39	77.58
Low	62.42	48.56
No. of Samples	60	1166



Turbidity

Units: NTU	Year 2013	Historical period of record
High	8.60	24.00
Mean	4.85	4.32
Low	1.80	0.85
No. of Samples	60	1001



Annual Averages

Indicator	Units	2009	2010	2011	2012	2013	Trend
Dissolved Oxygen	**mg/l**		7.03	6.48	6.23	6.55	
Dissolved oxygen saturation	**percent (%)**		97.69	93.23	92.40	94.53	
Light Attenuation	**K(1/m)**		1.15	1.10	1.01	1.08	
Salinity	**PSS**		30.48	30.77	32.00	29.10	
Turbidity	**NTU**		5.23	4.91	5.67	4.85	

Bay Contour Maps (2013)

Contour mapping is one of the best ways to visualize spatial differences in coastal water quality. The interactive map shown below presents monthly data for one selected water quality indicator atop an aerial view of the bay. Choose a different water quality parameter from the list at the top to change the map.

Showing 2013 Monthly Contour Maps for: Chlorophyll a

January

Contour Legend:

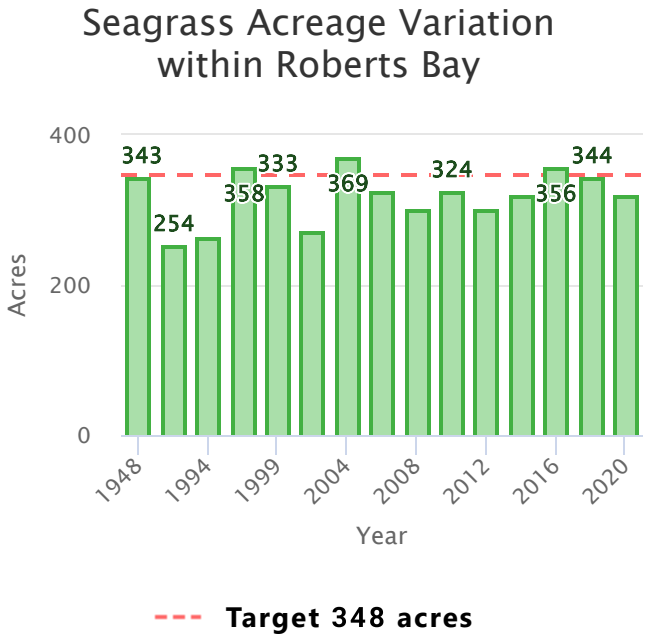
- Less than 1 mg/l
- 1.0 - 5.9 mg/l
- 6.0 - 10.9 mg/l
- 11.0 - 17.9 mg/l
- Greater than 18 mg/l

Seagrasses

Among the most important habitats in Florida's estuarine environments, seagrass beds are indispensable for the role they play in cycling nutrients, supplying food for wildlife, stabilizing sediments, and providing habitat for juvenile and adult finfish and shellfish. Use the interactive map below to observe the size, density and location of seagrass beds from year to year. The graph shows how the total amount of seagrass in the bay has changed over time. Seagrass calculations are aggregates of patchy and continuous seagrass measurements only. Recordings of attached algae are not included in these summaries.

Showing Seagrass Coverage for 2020:

Legend:
Continuous Seagrass Patchy Seagrass

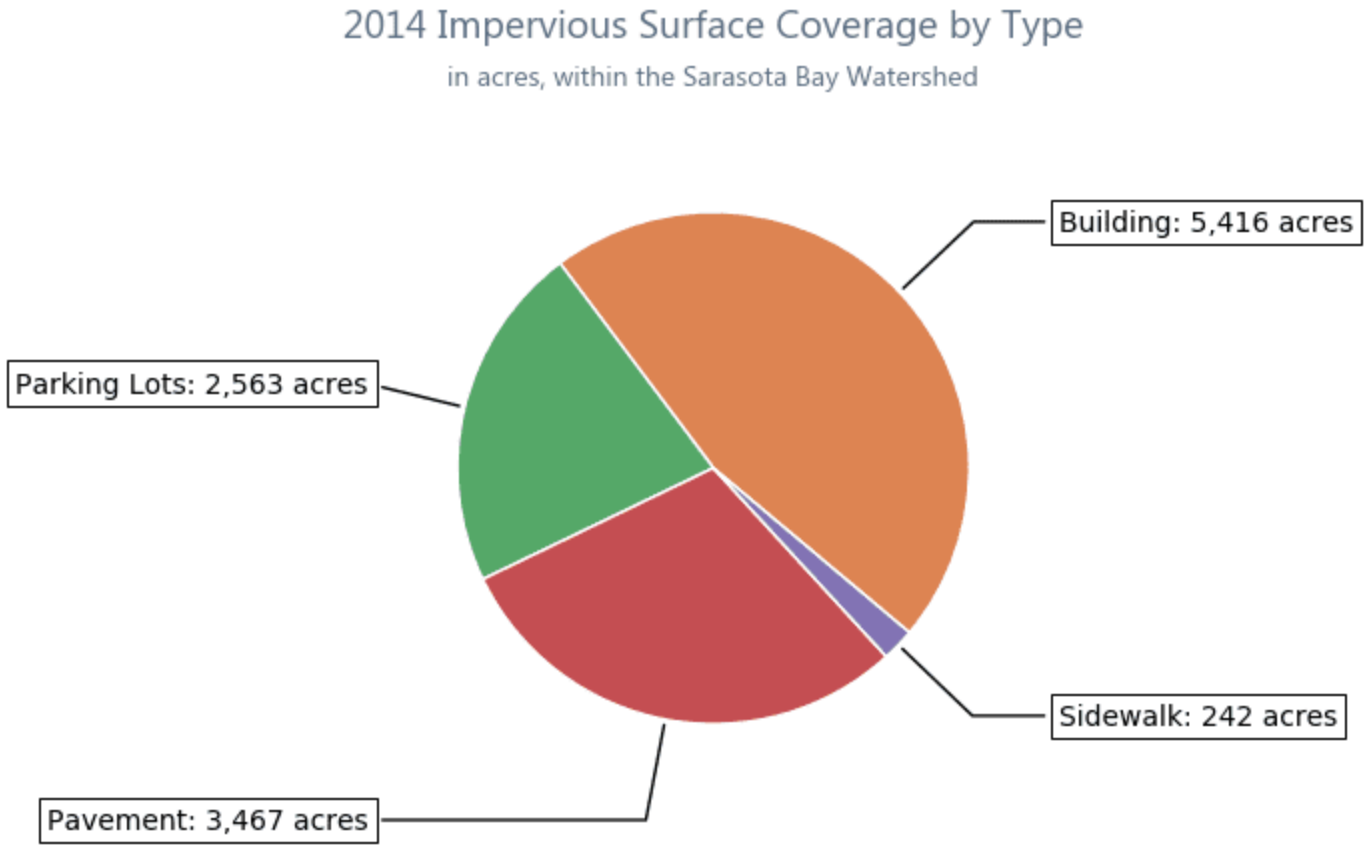


Impervious Features

Rain that falls on land that is in a natural state is absorbed and filtered by soils and vegetation as it makes it way into underground aquifers. However, in developed areas, "impervious surfaces" impede this process and contribute to polluted urban runoff entering surface waters. These surfaces include human infrastructure like roads, sidewalks, driveways and parking lots that are covered by impenetrable materials such as asphalt, concrete, brick and stone, as well as buildings and other permanent structures. Soils that have been disturbed and compacted by urban development are often impervious as well.

19% of the land area within the **Sarasota Bay Watershed** is covered by

impervious surfaces



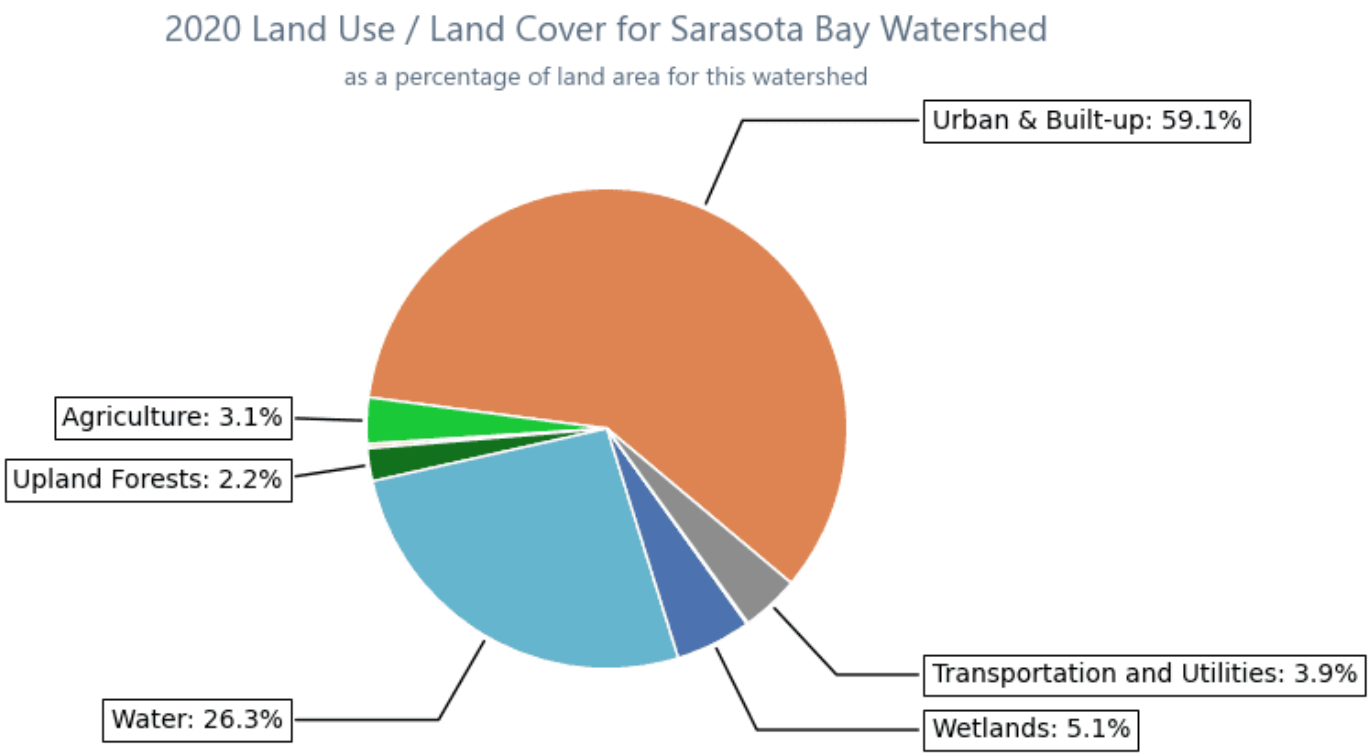
Land Use / Land Cover

Land use within a bay's watershed has a major effect on its water quality. In general, less development means better water quality. Land Cover/Land Use classifications categorize land in terms of its observed physical surface characteristics (upland or wetland, e.g.), and also reflect the types of activity that are taking place on it (agriculture, urban/built-up, utilities, etc.). Florida uses as its standard a set of statewide classifications which were developed by the Florida Department of Transportation.

Roberts Bay is located within the Sarasota Bay Watershed. The chart below shows the land use / land cover characteristics for Sarasota Bay Watershed within the boundary of this Water Atlas. **View details about the Sarasota Bay Watershed »**

Acreage and Percentage within each Land Use / Land Cover Category for Sarasota Bay Watershed

Land Use Classification	1990	2005	2011	2014	2017	2020	Trend
Urban & Built-up	32,908 **53.3%**	37,844 **61.3%**	38,343 **62.1%**	37,987 **61.6%**	38,749 **62.8%**	56,970 **59.1%**	
Agriculture	6,338 **10.3%**	2,497 **4%**	2,215 **3.6%**	2,309 **3.7%**	1,822 **3%**	2,986 **3.1%**	
Rangeland	547 **0.9%**	199 **0.3%**	225 **0.4%**	430 **0.7%**	208 **0.3%**	261 **0.3%**	
Upland Forests	3,588 **5.8%**	2,109 **3.4%**	1,874 **3%**	1,923 **3.1%**	1,756 **2.8%**	2,075 **2.2%**	
Water	13,350 **21.6%**	14,227 **23.1%**	14,278 **23.1%**	14,131 **22.9%**	14,255 **23.1%**	25,360 **26.3%**	
Wetlands	2,870 **4.7%**	2,227 **3.6%**	2,229 **3.6%**	2,372 **3.8%**	2,327 **3.8%**	4,889 **5.1%**	
Barren Land	29 **0%**	9 **0%**	99 **0.2%**	109 **0.2%**	100 **0.2%**	76 **0.1%**	
Transportation and Utilities	1,845 **3%**	2,602 **4.2%**	2,452 **4%**	2,453 **4%**	2,511 **4.1%**	3,783 **3.9%**	


2020 Land Use / Land Cover for Sarasota Bay Watershed
as a percentage of land area for this watershed
Urban & Built-up: 59.1%
Agriculture: 3.1%
Upland Forests: 2.2%
Water: 26.3%
Transportation and Utilities: 3.9%
Wetlands: 5.1%